AMENDMENT TO THE CLAIMS

Claims 1-10 (Cancelled)

11. (New) An optical fiber coupling part comprising:

an optical fiber; and

at least one GRIN lens fusion-spliced with an end of said optical fiber, said GRIN lens having a numerical aperture NA that is larger than a numerical aperture NA_s of a light emitting source.

12. (New) The optical fiber coupling part according to claim 11, wherein the numerical aperture NA is 0.43 or more.

13. (New) The optical fiber coupling part according to claim 12, wherein the GRIN lens has a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and is formed by a sol-gel method.

14. (New) The optical fiber coupling part according to claim 11, wherein the GRIN lens has a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and is formed by a sol-gel method.

15. (New) The optical fiber coupling part according to claim 11, wherein the optical fiber comprises a single mode optical fiber.

16. (New) An optical fiber coupling part comprising:

an optical fiber having numerical aperture NA_f;

a first GRIN lens having numerical aperture NA_1; and

a second GRIN lens having a numerical aperture NA_2, wherein a first end of said second GRIN lens is fusion spliced with an end of said optical fiber and a second end of said second GRIN lens is fusion spliced with said first GRIN lens,

wherein numerical aperture NA_1 is larger than numerical aperture NA_2.

17. (New) The optical fiber coupling part according to claim 16, wherein the numerical aperture NA_f of the optical fiber, the numerical aperture NA_1 of the first GRIN lens, the numerical aperture NA_2 of the second GRIN lens, and the numerical aperture NAs of a light emitting source are selected to satisfy the formula expressed by:

$NA_f \leq NA_2 < NA_s \leq NA_1$.

18. (New) The optical fiber coupling part according to claim 17, wherein

the numerical aperture NA_1 of said first GRIN is 0.43 or more.

19. (New) The optical fiber coupling part according to claim 17, wherein a length Z_1 of the first GRIN lens satisfies the formula expressed by:

$$Z_1 = (n_o * d_1/NA_1) \arctan (d_1/(NA_1 * L)$$

wherein a refractive index of glass at a center part of the first GRIN lens is set at n_o, a radius of the first GRIN lens is set at d_1, and a distance between the lens and the light emitting source is set at L.

20. (New) The optical fiber coupling part according to claim 17, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

21. (New) The optical fiber coupling part according to claim 16, wherein the numerical aperture NA_1 of said first GRIN is 0.43 or more.

22. (New) The optical fiber coupling part according to claim 21, wherein a length Z_1 of the first GRIN lens satisfies the formula expressed by:

$$Z_1 = (n_o * d_1/NA_1) \arctan (d_1/(NA_1 * L)$$

wherein a refractive index of glass at a center part of the first GRIN lens is set

at n_o, a radius of the first GRIN lens is set at d_1, and a distance between the lens and the light emitting source is set at L.

23. (New) The optical fiber coupling part according to claim 21, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

24. (New) The optical fiber coupling part according to claim 16, wherein a length Z_1 of the first GRIN lens satisfies the formula expressed by:

$$Z_1 = (n_o * d_1/NA_1) \arctan (d_1/(NA_1 * L)$$

wherein a refractive index of glass at a center part of the first GRIN lens is set at n_o, a radius of the first GRIN lens is set at d_1, and a distance between the lens and the light emitting source is set at L.

25. (New) The optical fiber coupling part according to claim 24, wherein a length Z_2 of said second GRIN lens is nearly ¼ as long as a zigzag cycle of a light beam propagated through said second GRIN lens or a length that is an odd number times the length of ¼ of the zigzag cycle.

26. (New) The optical fiber coupling part according to claim 25, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

27. (New) The optical fiber coupling part according to claim 24, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

28. (New) The optical fiber coupling part according to claim 16, wherein said first GRIN lens and said second GRIN lens have a coefficient of thermal expansion expressed by $15 \times 10^{-7}K^{-1}$ or less, and at least the first GRIN lens is made by a sol-gel method.

29. (New) The optical fiber coupling part according to claim 16, wherein the optical fiber comprises a single mode optical fiber.